

Hydrologic Model Manager

Short Name	HEC-HMS
Long Name	Hydrologic Modeling System
Description	
Model Type	The program is a precipitation-runoff model with hydrologic channel routing methods. A snowmelt preprocessor is under development.
Model Objectives	The program is designed to be applicable in a wide range of geographic areas for solving the widest possible range of rainfall-runoff problems including water availability, urban drainage, flow forecasting, future urbanization impact, reservoir spillway design, flood damage reduction, floodplain regulation, and systems operation.
Agency Office	U.S. Army Corps of Engineers Hydrologic Engineering Center 609 Second Street Davis, CA 95616 Tel: (530) 756-1104 Fax: (530) 756-8250 Web: http://www.hec.usace.army.mil
Tech Contact	William Scharffenberg, Research Division Hydrologic Engineering Center
Model Structure	Detention Storage: Method is linear storage reservoir as part of SMA* Overland Flow: Methods include Clark, Snyder, SCS, and user-specified unit hydrographs, kinematic wave, and modClark (semi-distributed linear unit hydrograph) Channel Flow: Methods include lag, Muskingum, Muskingum-Cunge prismatic channel, Muskingum-Cunge 8-point channel, kinematic wave, and modified Puls
Interception	Method is linear storage reservoir as part of SMA*
Groundwater	Methods include recession, constant monthly, and linear storage reservoirs as part of SMA
Snowmelt	A separate preprocessor currently under development uses the temperature index method from the SSARR model on a gridded-basis
Precipitation	Methods include user-specified hyetograph, user-specified gage weights, inverse distance gage weights, gridded precipitation, frequency hypothetical storm, and standard project storm
Evapo-transpiration	Method is monthly average as part of SMA*
Infiltration	Methods include Green & Ampt, SCS curve no., initial /constant rate, deficit / constant rate, gridded SCS curve no., and linear storage reservoir as part of SMA*
Model Paramters	Required and optional parameters are dependent on the selected computation method.
Spatial Scale	The watershed is represented as a dendritic network of subbasins, channels, reservoirs, diversions, sources, junctions, and sinks. Each subbasin is homogeneous unless the modClark semi-distributed linear unit hydrograph transform is used.
Temporal Scale	The length of a simulation is limited only by computer resources and can operate at time steps from 1 minute to 24 hours. Version 1.1 is primarily event-based with a simple continuous simulation capability. Version 2.0 will provide a complete continuous simulation capability.

Input Requirements	The minimum required input is precipitation data and parameters required by the selected computation methods. Optionally, observed flow data and stage-flow curves may be included.
Computer Requirements	Windows 98/95/NT on Intel compatible architecture with 16Mb memory and 10 Mb disk space; Sun Solaris 2.5 or higher with 64Mb memory and 10Mb disk space
Model Output	The program produces time-series of flow and writes them to a database for all nodes in the drainage network.. All time-series of precipitation, infiltration, overland flow, and baseflow necessary to compute total flow are also written to the database. The program produces summary tables and graphs at any node as requested by the user.
Parameter Estimatr Model Calibrtn	The program includes a versatile optimization facility that may be employed when observed flow data are available. Goodness-of-fit is estimated by either percent error in peak flow, sum of absolute residuals, sum of squared residuals, or peak-weighted root mean square error. The search algorithm is either a uni-variant or downhill simplex method.
Model Testing Verification	The HEC-HMS computational engine is based on the HEC-1 engine which is backed by 30 years of research, field testing, and maintenance. Formal documentation of the verification process for HEC-HMS is under development.
Model Sensitivity	Sensitivity is dependent on the selected computation method.
Model Reliability	The Federal Emergency Management Agency (FEMA) has accepted the program for use in floodplain management studies. Reliability for an individual project is dependent on the quality of available data and the skill of the user.
Model Application	The program has been applied to civil works projects involving real-time flood forecasting, flood damage reduction, urban and rural drainage, and channel routing.
Documentation	Hydrologic Modeling System HEC-HMS User's Manual Hydrologic Modeling System HEC-HMS Technical Reference Manual (due soon) Various Technical Papers, Project Reports, and Training Documents
Other Comments	* SMA refers to Soil Moisture Accounting and is a feature of the upcoming Version 2.0 Version 1.1 is currently available from many third-party vendors who can provide the program, documentation, training, and other related services. The program and documentation are also available from the HEC website. Version 2.0 is expected before the end of the current year and will be similarly available.
Date of Submission	8/10/1999 2:30:05 PM
Developer	
Technical Contact	
Contact Organization	